

**Installation Guide**  
**for the OpScan *i*NSIGHT™ 70 Scanner**



# **Installation Guide**

## **for the OpScan *i*NSIGHT™ 70 Scanner**

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This equipment complies with the requirements in part 15 of FCC Rules for a Class A computing device. Operation of the equipment in a residential area may cause unacceptable interference to radio and television reception requiring the operator to take whatever steps are necessary to correct the interference.

#### **For Users in Canada**

The digital apparatus does not exceed the Class A limit for radio noise emission from digital apparatus set in the Radio Interference Regulations of the Canadian Department of Communications.

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# Revision Log

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|     | 5/05 | Manual Released |

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# Preface

## About This Manual

This manual describes how to set up and install the Pearson NCS OpScan iNSIGHT 70 scanner. This manual does not document how to install and configure the OpScan iNSIGHT 70 system software. OpScan iNSIGHT 70 scanner system software is pre-installed and configured at Pearson NCS.

The scanner is typically used with a computer, a color monitor, a printer, and can be connected to a server as part of a scanning network system.

This guide is intended for use by Pearson NCS-trained field engineers. It is assumed that the field engineers have had some training or experience in computer setup and installation, scanners and scanning technology, and networks.

For information on operating the scanner, refer to the *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner*.

## Contents of the Manual

**Chapter 1** provides an overview of the OpScan iNSIGHT 70 scanner's features and parts.

**Chapter 2** describes the process of unpacking and positioning the system components, setting up, and installing the OpScan iNSIGHT 70 scanner.

**Chapter 3** provides information on installing the scanner computer and other peripherals.

**Chapter 4** provides information on scanner checkout procedures, system software, system verification, and customer hand-off.

**Note:** Depending on when you purchased your OpScan iNSIGHT 70 scanning system, you are most likely running Windows XP® as the operating system on your host computer. However, because of the possibility of different operating systems, this manual will reference the operating systems generically as the “Windows” operating system.

## Related Documentation

Additional information can be found in the following manuals.

| System Component          | Manual Title  |
|---------------------------|---|
| OpScan iNSIGHT 70 Scanner | <i>Operator's Guide for the OpScan iNSIGHT™ 70 Scanner</i>                |
|                           | <i>Operator's Quick Reference Card for the OpScan iNSIGHT™ 70 Scanner</i> |
|                           | <i>Quick Check Guide for the OpScan iNSIGHT™ 70 Scanner</i>               |
|                           | <i>Maintenance Manual for the OpScan iNSIGHT™ 70 Scanner</i>              |
|                           | <i>Parts Manual for the OpScan iNSIGHT™ 70 Scanner</i>                    |
| ScanTools                 | <i>ScanTools® Plus User's Guide</i>                                       |

## Contacting Customer Support

If you have difficulty installing, configuring, or operating your scanner, you will need our response as quickly as possible.

To speed our ability to help you, please have the following information available prior to contacting Pearson NCS:

- Customer number - listed on the shipping documents
- Serial number and model number - located on the back of the scanner
- A description of the problem, including whether you can determine the source of the problem based on its symptoms
- Any pertinent information related to the problem such as error messages or sample output

**IMPORTANT:** Services not covered under your maintenance program may be billable. Your customer support representative will inform you if you request a billable service.

### Customer Support

**Hours: Weekdays 8:00 a.m. to 5:00 p.m. Customer's Local Time**  
(except for Alaska and Hawaii which is through 7:00 p.m. CST)

**1-800-338-5544**

**Note:** Customer support is not available on Pearson NCS holidays.

## World Wide Web Access

We invite you to visit our Web site at <http://www.pearsonncls.com>.



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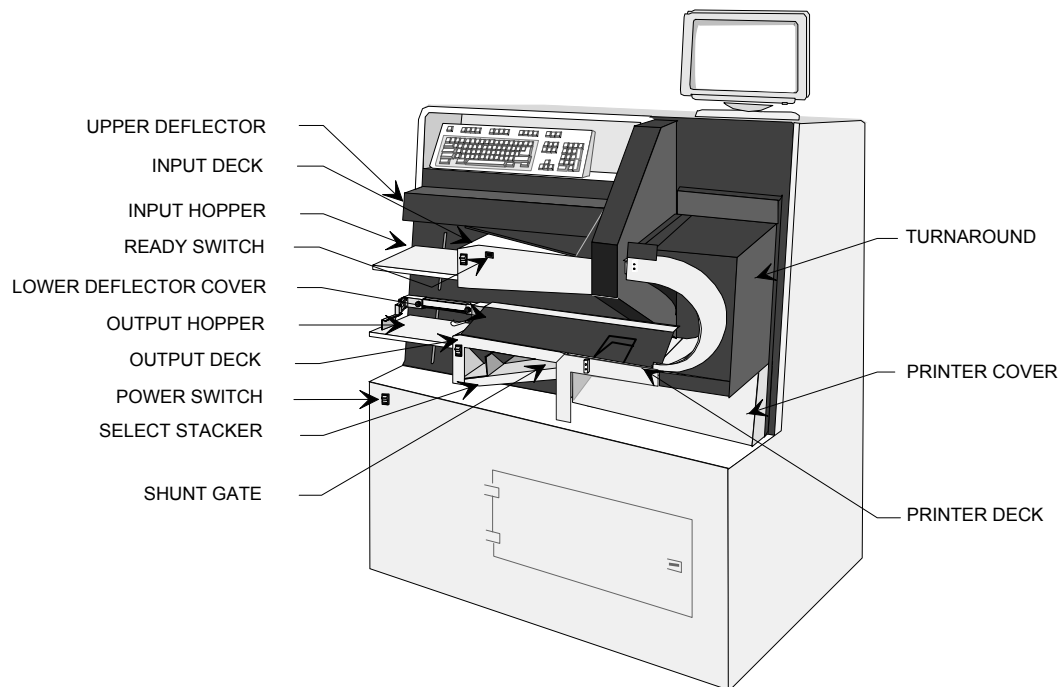
# Chapter 1

## Scanner Overview

This chapter presents an overview of the OpScan iNSIGHT 70 scanner and provides information on how to receive technical support for hardware and software problems.

### Overview of the Scanner

The OpScan iNSIGHT 70 is a device that captures the image of a form and sends that image to a host computer for analysis. Figure 1-1 illustrates the parts of the scanner.



**Figure 1-1** Scanner Parts

In a typical scanning session, these components function as follows:

- The **power switch** turns on the scanner and any other system components that are plugged into the scanner's internal power strip.
- The **READY switch** starts and stops the scanner.

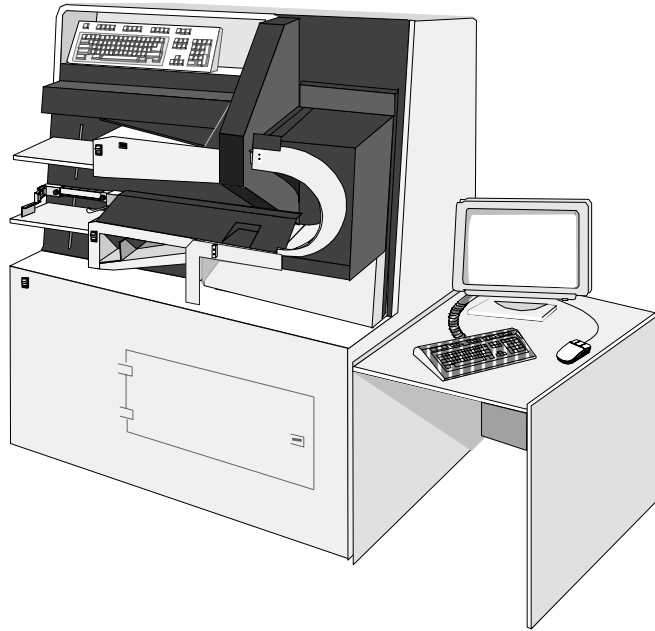
## Scanner Overview

### Overview of the Scanner

- The **input hopper** holds the forms that are ready to be scanned. When the scanner is made READY, the input hopper raises; when the scanner stops, the hopper lowers, allowing you to load more documents. The input hopper accepts stacks of up to 750 forms, depending on the thickness and condition of the sheets.
- The **input hopper height adjustment switch** allows you to adjust the height of the input hopper so that the scanner can pick a sheet. Refer to the *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner* for instructions on setting this adjustment.
- The **output hopper** receives the forms that are successfully scanned. When the scanner starts, the output hopper is raised; when the scanner stops, the stacker is lowered, allowing you to remove the sheets. Before scanning, the **output sheet stop adjustment knob** should be set to the length of the scanned forms so they will stack properly. The **output hopper height adjustment switch** adjusts the height at which the hopper halts. Refer to the *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner* for instructions on making these adjustments.
- The scanner picks the forms from the input hopper one at a time. From there, the form moves along the **transport bed** by rollers that continually drive the form into the rail to remove possible skew. The form then passes through the **read heads** where the **cameras** capture the image of the form.
- The form now goes through the **turnaround station** where the form is turned over and sent to the **wait station**. At this point the software application determines where the form should go. If the system includes the optional **transport printer**, then any information that needs to be printed on the form will be sent there. The form is imprinted as it passes over the print head. The form is then sent to one of two places:
  - The **output hopper** accepts up to 750 forms, depending on the thickness and condition of the sheets. This hopper is reserved for forms that are read with no errors.
  - The **select stacker** accepts up to 200 forms, depending on the thickness and condition of the sheets. The software controls the stacker's use. It is used for forms with correctable and non-correctable system errors. For example, if the system detects a multiple response on a grid, it sends the form to the select stacker. The operator can fix the form and scan it again; or, if the wrong form was scanned, it could be sent to the select stacker.

## Typical Standalone Configuration

Figure 1-2 illustrates the components of a typical standalone OpScan iNSIGHT 70 scanner configuration. The form's image is sent from the OpScan iNSIGHT 70 scanner to the computer for processing.



**Figure 1-2** Scanner Standalone Configuration

## Customer Support

If you have a problem, call Pearson NCS Customer Support. An analyst will respond to questions and concerns when they receive your call. Their only requirement is that you first provide them with the information that they need to help you.

**IMPORTANT:** Services no longer under warranty or covered under a service agreement, may be billable. Your customer support representative will inform you if you require a billable service.

This section tells you how to request and receive Customer Support assistance in two steps:

- Calling requirements
- Calling procedure

### Calling Requirements

To respond to questions and concerns about your scanner, Pearson NCS requires that you provide certain information when you call for assistance. Pearson NCS cannot process your request for service unless you satisfy these calling requirements.

Read the list of requirements that follows. Check off each requirement as you complete it. To place a request for service, you must provide Pearson NCS with your:

**1. Customer number**

Your customer number is listed on the shipping documents that Pearson NCS shipped with your scanner. If you do not have access to these documents, ask the Customer Support operator for your customer number the first time you call to request assistance.

Record your customer number for future use: \_\_\_\_\_

**2. Scanner serial number and model number**

The label on the scanner that contains the serial and model numbers is located on the back of the scanner cabinet near the power cord and on the mechanism plate under the outer turnaround deflector.

**Note:** Verify the serial and model numbers each time you call.

Record your scanner serial and model numbers for future use.

Serial Number \_\_\_\_\_

Model Number \_\_\_\_\_

## Calling Procedure

The procedure used to request Customer Support assistance is simple and straightforward. All that's required is that you provide some basic information during your call. (Read the first part of this section for a list of the calling requirements.)

To call Customer Support, follow these seven steps:

1. Be familiar with the procedures described in this manual.
2. Write down a description of the problem you are having to ensure that you address all of your concerns with the Customer Support analyst.
3. Write down a description of the action(s) you have taken to resolve the problem.
4. Note any error messages that are displayed on your computer's screen.
5. Be ready to provide the scanner serial number, your customer number, and any other relevant information.
6. Call the Customer Support number – 1-800-338-5544 – and describe the problem that you are having with your scanner to the Pearson NCS dispatcher.
7. A dispatcher transfers your call to a Customer Support analyst.

If an analyst is not available, you can ask to be put on hold or request a return call.

Customer Support typically returns the call within one hour and responds to your questions about the problem that you reported.



**WARNING:** Pearson NCS cannot process a request for service without receiving certain basic information from you. Your call cannot be accepted unless you can supply the scanner's serial number and your customer number. Satisfy the calling requirements described in this section before you call Pearson NCS!

## Customer Support

**Hours: Weekdays 8:00 a.m. to 5:00 p.m. Customer's Local Time**  
(except for Alaska and Hawaii which is through 7:00 p.m. CST)

**1-800-338-5544**

**Note:** Customer support is not available on Pearson NCS holidays.

## **Scanner Overview**

Customer Support



# Chapter 2

## Scanner Installation

### Overview

This chapter describes how to set up and install the standalone OpScan iNSIGHT 70 scanner, the computer, the monitor, and the mouse.

The OpScan iNSIGHT 70 scanner system consists of the following components:

- Model OpScan iNSIGHT 70 scanner
- Computer
- SVGA monitor
- Duplex Heads (InfraRed/Red)
- Transport Printer (optional)
- Bar Code (optional)

### Preparation

Before assembling the standalone OpScan iNSIGHT 70 scanner, check to make sure that you have all the hardware and accompanying documentation as listed below.

### Hardware

The following hardware components are required:

- Computer with SVGA monitor, keyboard, mouse, and furniture (standalone only)

Documentation: Manufacturer's user manuals

- A model OpScan iNSIGHT 70 image scanner with interface card and cable  
Documentation: *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner* and the *Maintenance Manual for the OpScan iNSIGHT™ 70 Scanner*

- Normalization and Calibration forms packet

Documentation: *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner*

## Scanner Installation

### Preparation

## Software

The following software components are required:

- Microsoft® Windows XP® operating system software  
Documentation: The appropriate Windows operating system user's guide
- Scanner application software  
Documentation: *ScanTools® Plus User's Guide*
- Scanner Exerciser diagnostic software (or equivalent)  
Documentation: *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner* and *Maintenance Manual for the OpScan iNSIGHT™ 70 Scanner*

## Installation Sequence

The installation sequence for the OpScan iNSIGHT 70 scanner is:

1. Check the installation site to verify that it is ready for setup and installation of the scanner with its computer, monitor, keyboard, and mouse.
2. Install the scanner.
3. Install the computer, monitor, keyboard, mouse, and furniture.
4. Check the voltages.
5. Connect the network cables (optional).
6. Configure the internet network addresses and test the network (optional).
7. Verify that all software has been pre-loaded.
8. Run the Scanner Exerciser Utility to check the following:
  - Sheet feeding (See **Scan Sheets** menu).
  - Selecting and printing (See **Scan Options** menu).
  - Color selection (See **Configuration**).
9. Run Scanner Exerciser to check alignment (See **Check Alignment**).
10. Run the appropriate Camera Setup utility<sup>1</sup> to check and adjust camera/mirror alignment and focus.
11. Run the Normalize and Calibrate Utility on the scanner.
12. Run sample application using ScanTool Plus.
13. Power off the system.

The above installation sequence and the following instructions serve as a typical step-by-step guide only. They may not exactly fit your setup.

---

1. For detailed information on how to run Camera Setup or Fast Camera Setup, refer to the *Maintenance Manual for the OpScan iNSIGHT 70 Scanner*, Chapter 3.

## Checking the Installation Site

Before you begin installing the OpScan *i*NSIGHT 70 scanner, verify the following site conditions:

- Check the physical dimensions of the selected site to ensure adequate space.
  - The OpScan *i*NSIGHT 70 scanner is 57.5 inches high, 48 inches wide, and 29 inches deep.
  - If the scanner is near a wall, be sure to leave approximately 24 inches of space between the scanner and the wall. This space is required so that an operator can open the rear panel doors.
- Check that the site selected for the scanner meets all power and environmental requirements.
  - The temperature must be between 60° and 80° Fahrenheit (16 - 27 C).
  - The humidity must be between 40% and 60% (non-condensing).
- Heat dissipation is 5300 - 5500 BTU/hr.
- Check that the circuit from the power source is a dedicated circuit for the scanner.

## Scanner Installation

### Installing the Scanner

## Installing the Scanner

The OpScan iNSIGHT 70 scanner is delivered to the customer shrink-wrapped and up-right on its own four casters. Roll the scanner to its permanent location.

### Unpacking the Scanner

To unpack the scanner, do the following:

1. Remove the clear vinyl dust cover.  
**Caution:** Do NOT throw the clear vinyl dust cover away. It can be used to protect the scanner during periods of non-use or when moving it to another location.
2. Remove the clear plastic shrink-wrap.
3. Remove the packing materials (sheets of paper) located:
  - on the transport bed,
  - on the hopper tables, and
  - between the read head glass.
4. Remove the packing materials (blocks of styro-foam) located:
  - between the printer deck and printer cover (holds the printer cover in place), and
  - between the sliding tray for the PC and interior bulkhead (prevents the PC tray from sliding during shipping).

### Spares

A separate box of spares is provided with each scanner. This includes the following:

- Retard pads
- Pick belts
- Manuals
- A key for the front panel door

**Note:** For safekeeping, place the key in the hole located below the printer deck and to the left of the printer cover. Keep the spare retard pads and pick belts in a safe place such as on the computer shelf inside the scanner cabinet. These spares are used as replacements (See the *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner* for instructions on removing/replacing retard pads and pick belts).

## Checking the Voltage

Before you plug the OpScan iNSIGHT 70 scanner into the designated wall outlet, the following power and grounding requirements must be met and maintained to ensure optimum performance of the scanner and its peripherals. To verify that the power and grounding requirements have been met, refer to the following topics: Power Noise, Grounding, and Site Power Wiring Recommendations.

### Power Noise

The OpScan iNSIGHT 70 scanner is designed to operate satisfactorily under conditions of reasonable input power noise. Input power noise specifications are as follows:

**Table 2-1** Input Power Noise Specifications

| Condition       | Description   |
|-----------------|---|
| Definitions     | <p><b>Surge or Sag</b> - any sudden positive or negative excursion in the level of the input voltage having a duration from 0.005 to 5 seconds.</p> <p><b>Transient</b> - any sudden positive or negative change in the level of the input voltage having a duration of between 1 nanosecond and 5 milliseconds.</p>  |
| Limits          | No surge or sag shall exceed $\pm 15\%$ of the normal rated voltage. However, the surge or sag shall be considered acceptable provided its amplitude does not exceed $\pm 50\%$ of the normal rated voltage and it returns to the steady-state rated level within 3 cycles of input power.  |
| Recommendations | <p>Dedicate a feeder line between the main building power panel and the system branch circuit power panel serving the OpScan iNSIGHT 70 system.</p> <p>If transients, surges, or sags outside of the limits stated above exist with a dedicated feeder, do one or both of the following.</p> <ul style="list-style-type: none"> <li>• Install a line conditioner to limit transients.</li> <li>• Use a constant-voltage isolation transformer to control surges or sags.</li> </ul> |

### Grounding

Proper system grounding is extremely important to the safe and reliable operation of the system. The OpScan iNSIGHT 70 scanner ground must meet two requirements:

1. It must serve as a return path for current in case of a short circuit between the power line and the chassis of any system component.
2. It must serve as the ground reference point for the OpScan iNSIGHT 70 system components and data cables.

## Scanner Installation

### Installing the Scanner

#### *Dedicated Ground*

A dedicated isolated/insulated ground for the OpScan iNSIGHT 70 system must be provided. If possible, route a dedicated ground conductor between the main power panel and the OpScan iNSIGHT 70 system branch circuit (with the dedicated feeder). If a dedicated ground conductor is not feasible, then another code-approved method must be used. (The isolated ground conductor is noted in the National Electrical Code, Section 250-74, Exception 4.) Use of an isolated ground rod or grounding to a water pipe is not acceptable.

An isolated/insulated ground conductor, equal to or larger in size than the heaviest gauge AC feeder conductor in the circuit, should be bonded to the ground bus in the building main power panel. Route it with the circuit conductors in the wiring conduit. Pass this ground through any intermediate panel boards without connection to the panel board grounding terminal bars. The National Electric Code, cited above, allows for the installation at the intermediate panel board of an isolated ground bus, constructed from a terminal block kit, for the interconnection of the isolated ground conductor.

This isolated/insulated ground conductor runs as a single, uninterrupted circuit between the building main power panel and the OpScan iNSIGHT 70 system branch power panel. It forms the interconnection point for the third-wire grounds of all OpScan iNSIGHT 70 system components. Connect all OpScan iNSIGHT 70 system component third-wire grounds to this ground; do not connect any equipment other than OpScan iNSIGHT 70 system components to this ground conductor. This condition is met if all system components are plugged into the switched convenience outlet in the base of the scanner.

**Note:** At some sites, local regulations require that all installed equipment be connected to a system common ground. In this case, connect all OpScan iNSIGHT 70 system components to the common ground at only one point. Connect third-wire grounds of system components into a common bus connected to the common ground at a single point.

**Note:** Make sure the equipment third-wire ground (green wire) does not become connected to the conduit at the outlet box or connector. To avoid an inadvertent connection, use a NEMA 5-20R type isolated-ground receptacle such as a Hubble IG-5362.

#### *Grounding in Multi-Story Buildings*

When installing the OpScan iNSIGHT 70 system in a multi-story building, provide a low noise ground by connecting the isolated ground of the system to the structural steel of the building. Install the isolated ground system as described above. In addition, bond one end of a heavy gauge wire or copper braid to the isolated ground bus in the branch circuit panel serving the OpScan iNSIGHT 70 system. Weld the other end of this wire or braid to the nearest vertical steel structural member. Do not substitute a water pipe or an isolated ground rod for the vertical steel member.

#### *Ground-To-Neutral Specifications*

With circuit power turned off, the resistance between the circuit neutral conductor and the isolated ground conductor must be less than 2.1 ohms.

With circuit power on and all OpScan *i*NSIGHT 70 system components unplugged, the voltage between the circuit neutral conductor and the isolated ground conductor must be less than 0.6 VAC.

## Site Power Wiring Recommendations

Table 2-2 describes the conditions for power wiring at a scanner site.

**Table 2-2** *Power Wiring at a Scanner Site*

| Condition                                 | Description   |
|---|---|
| Dedicated Feeder                          | Run a separate dedicated feeder from the building main power panel to the branch power panel serving the OpScan <i>i</i> NSIGHT 70 system. The cabling should be of sufficient diameter to produce no less than 110V at the outlet when the scanner is connected and powered on. This feeder should be a minimum of 30 amp service to allow for future growth of the system.  |
| Dedicated Isolated/ Insulated Ground      | An isolated/dedicated ground is required. Run this ground conductor as an uninterrupted circuit from the power panel to the OpScan <i>i</i> NSIGHT 70 system branch panel. The gauge of this conductor must be at least as large as that of the AC circuit conductors in all stages of the circuit.   |
| Panel Branch Circuits                     | All branch circuits leaving the OpScan <i>i</i> NSIGHT 70 branch power panel should be at least 10 AWG copper wire. There should be no circuits from this power panel serving devices that are not part of the scanner system.<br><br>One branch circuit from this power panel should be dedicated at the scanner (this circuit will also service the computer and monitor), and there should be at least one additional dedicated circuit for each additional scanner.   |
| Additional Utility Convenience Connectors | Provide additional convenience outlets in the vicinity of the OpScan <i>i</i> NSIGHT 70 scanner. Connect these outlets (may be used for vacuums, paper joggers, and other electrical devices) to a branch panel other than the scanner branch panel to provide maximum noise isolation for the OpScan <i>i</i> NSIGHT 70 system components.   |
| Scanner Electrical Connections            | Dedicate one 15 amp (120 VAC) or 7.5 amp (220 VAC) circuit to each OpScan <i>i</i> NSIGHT 70 scanner at the site. All may be served from the same branch panel, provided its rated capacity is not exceeded.  |
| Electrical Outlets                        | All 120V outlets for the OpScan <i>i</i> NSIGHT 70 scanner should be Hubbell IG-5362 or equivalent (NEMA 5-20R). All 240V outlets should be Hubbell IG2410A or equivalent. Outlets for the peripheral equipment should be of the type and rating specified in the hardware reference manuals for the equipment.<br><br>The quantity of outlets that must be provided for the peripheral equipment varies according to system configuration. (See Panel Branch Circuits above.) Outlets should be located within 6 feet (2 meters) of the working location of the equipment. |

## Electrical Requirements

The steady-state line-to-neutral voltage should be maintained within -10% to +5% of the normal rated voltage. The short term and long term frequency variations must be maintained at less than  $\pm 5\%$  of the specified power line frequency as measured at the input power side of the scanner when it is powered on. Table 2-3 lists the electrical requirements for the power operation of the OpScan iNSIGHT 70 scanner.

**Table 2-3** *Electrical Requirements*

| <b>Power</b> | <b>Frequency Limits</b> | <b>Voltage Limits</b>   | <b>Other data</b>                           |
|--------------|-------------------------|-------------------------|---|
| Standard     | 60 HZ $\pm 5\%$         | 115V $\pm 10\%$         | On 15 Amp., single-phase dedicated circuit  |
| Option 1     | 50 HZ $\pm 5\%$         | 100 or 110V $\pm 10\%$  | On 15 Amp., single-phase dedicated circuit  |
| Option 2     | 50 HZ $\pm 5\%$         | 220 or 240 V $\pm 10\%$ | On 7.5 Amp., single-phase dedicated circuit |

After you have verified the power and grounding requirements, perform the "Power Supply Check-out Procedures."

### Power Supply Check-out Procedures

Perform the following checks with the scanner on but with the transport bed motor off (unless otherwise directed by the procedure).

The OpScan iNSIGHT 70 scanner is equipped with four power supplies. They are:

- 914 022 769, +12V 250W Power Supply
- 914 022 264, +12V 200W Solenoid Boost Power Supply (Unregulated)
- 914 022 744, +5V Power Supply (LEDs)
- 914 022 751, +5V and  $\pm 15$ V Logic Power Supply

The +12V, 250W power supply produces +12.5V for the transport bed solenoids and hopper drive motors. The +12V, 200W, power supply produces +12V boost voltage to pull the solenoids. The +5V power supply produces +5V for the read head LEDs. The logic power supply produces +5V, +15V and -15V logic power for the cameras and various scanner PC boards.

The logic power supply and the LED power supply require periodic check-out and adjustment. In addition, the 12V, 250W power supply needs to be adjusted to 12.5V. If any voltage is outside the proper range, adjust the outputs as described in the following "Logic Voltage Checkout Procedures." If you cannot adjust the output, replace the power supply. There are no field repair procedures for any of the scanner's power supplies.



## Logic Voltage Check-out Procedure

The outputs of the power supplies are read at their most critical point-the input to the Camera Controller Board, the Solenoid Clutch Activation Board, and the Top LED Mother Board.

1. Turn on the scanner power switch.
2. Use a DVM to measure the outputs to the voltages listed in Table 2-4. Be sure to connect your ground probe to TPG1, TPG2, TPG3, or TPG4 on the Camera Controller Board.

**Table 2-4** Logic Voltages

| Nominal Voltage | Camera Controller Pin Location | Solenoid Clutch Activation Board (SCAB Pin Location | Top LED Mother Board Pin Location | Acceptable Range    |
|-----------------|--------------------------------|---|-----------------------------------|---------------------|
| +5V             | J5 - 3                         |   |                                   | +4/95 to + 5.20V DC |
| -15V            | J5 - 1                         |   |                                   | -15 to - 15.20V DC  |
| +15V            | J5 - 2                         |   |                                   | +15.0 to -15.20V DC |
| Ground          | TPG1, TPG2, TPG3, TPG4         |   |                                   |                     |
| +12.5V          |                                | J9 - 4  |                                   | +12.5 to +13V       |
| +V Boost        |                                | J9 - 7  |                                   | +12 to +16V         |
| +5V             |                                |   | J3 - 1                            | +5 to +5.5V         |

## +12V Boost Power Supply

There are no adjustments to the +12V, 200W boost power supply. If its output is not +12.5V to 16V, replace the supply.

## Location of the Power Supplies

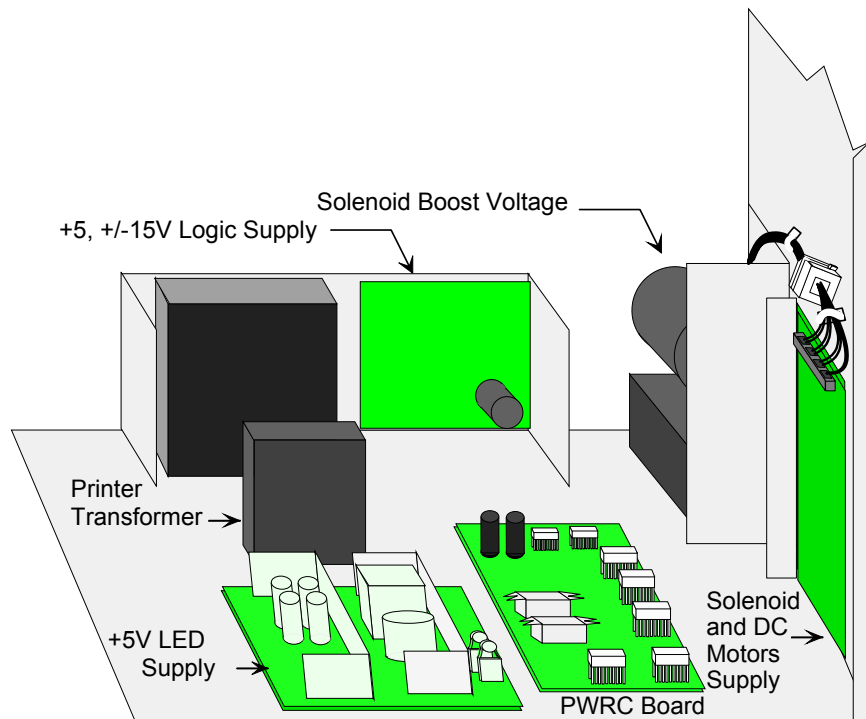
Figure 2-1 and Figure 2-2 illustrate the location of the power supplies and the location of the adjustment potentiometers. The power supplies that may require checkout and periodic adjustments are:

- +12V, 250W, Solenoid and DC Motors Power Supply (adjusted to +12.5V)
- +5V LED Power Supply
- +5V and  $\pm 15$ V Logic Power Supply

**Note:** The Logic Power Supply is labeled  $\pm 12$ V, but it should be adjusted to  $\pm 15$ V.

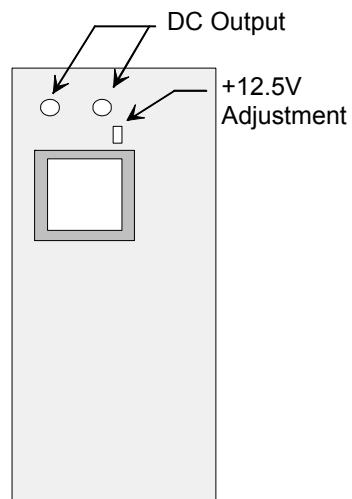
## Scanner Installation

### Installing the Scanner

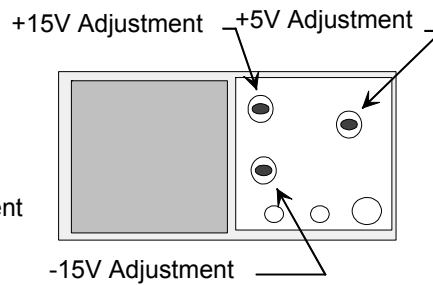


**Figure 2-1** Location of the Power Supplies

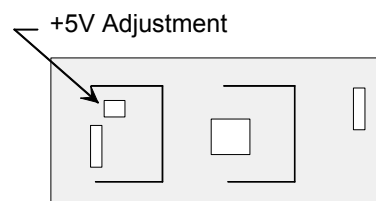
#### Solenoid and DC Motor Power Supply



#### Logic Power Supply



#### LED Power Supply



**Figure 2-2** Adjustment Locations

# Chapter 3

## Installation of Host Computer and Peripherals

### Overview

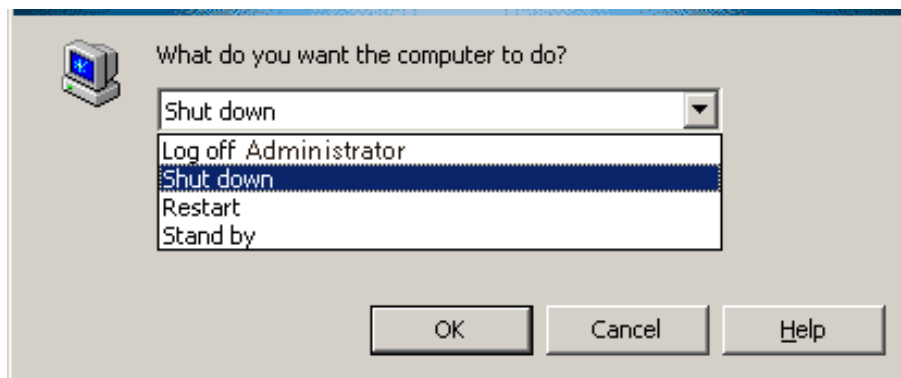
This chapter provides information on setting up and installing the computer and other peripheral components in a OpScan *i*NSIGHT 70 scanner standalone or network configuration. Installation information on optional equipment, such as a system printer and/or Bar Code Reader, is also provided.

Begin by unpacking the computer, the monitor, and the keyboard. Unpack other equipment as required. Refer to the manufacturer's user manuals for installation instructions and assistance when performing the procedures discussed on the following pages.

**Caution:** The monitor and printer power cords should be plugged into AC wall outlets or a power strip located outside the scanner.

There may be situations where you are installing additional OpScan *i*NSIGHT 70 scanners, additional peripheral equipment, or printers and you need to power the system down. In this case, you should use the following shutdown procedures.

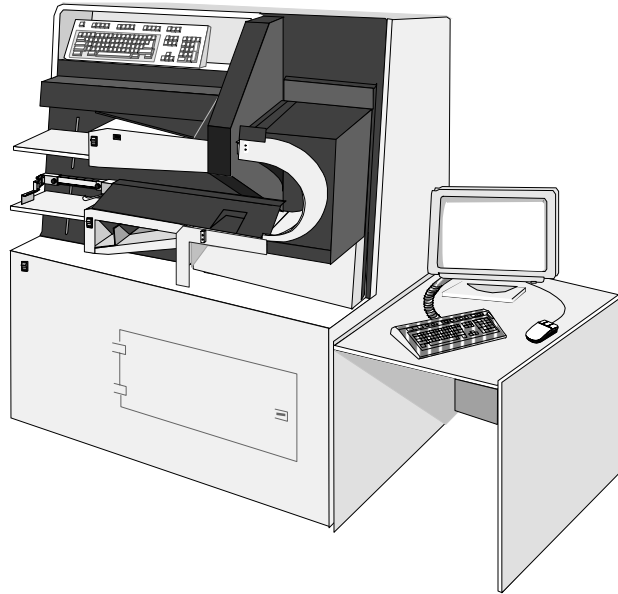
- Hold down the ALT key and press F4. The following menu is displayed.



- Highlight the Shut down option.
- Click **OK**.

## Standalone Installation

The OpScan iNSIGHT 70 scanner in a standalone configuration requires a computer, a monitor, a keyboard, a mouse, and a table (for the monitor, keyboard, and mouse). An optional printer may also be installed.



**Figure 3-1** Standalone Configuration

## Host Computer

This section discusses installation and internal cabling for the host computer in a standalone configuration.

### Installation

Do the following.

1. Remove the computer's cover.  
**Caution:** Use ESD precautions (including a grounded wrist strap) for step 2.
2. Make sure that the scanner interface cards and all ribbon cables are fully seated.
3. Replace the cover on the computer.
4. Open the rear panel doors and place the computer on the shelf. The front of the computer must face the front of the scanner.

### Cabling

In preparation for cabling, Pearson NCS recommends that you do the following:

- Set the computer on the back lip of the shelf during cable installation so that the back of the computer is tilted up. This provides easier access to the computer's ports.
- Uncoil all cords and cables, separate them, and lay them out on the floor.

The following cabling instructions are for a standalone configuration. Refer to Figure 3-4, Figure 3-5, and Table 3-1 at the end of this chapter.

1. Install the computer power cord.
  - Attach the power cord connector to the back of the computer.
  - Ensure that the other end is plugged into the scanner's power strip.
2. Complete installation of the 25-pin straight through cable from the PRTCON board (for the optional printer) to the back of the computer.
  - One end of this cable is already attached to the PRTCON board.
  - Connect the other end to the back of the computer.
3. Complete installation of one 6-pin DIN cable from the KEMCON board (for the keyboard) to the back of the computer.
  - One end of this cable is already attached to the KEMCON board.
  - Connect the other end to the back of the computer in the keyboard port.
4. Complete installation of the other 6-pin DIN cable from the KEMCON board (for the mouse) to the back of the computer.
  - One end of this cable is already attached to the KEMCON board.
  - Connect the other end to the back of the computer in the mouse port.
5. Complete installation of the 5 BNC/15-pin DIN cable from the bulkhead (for the monitor) to the back of the computer.
  - One end (5 BNC end) is already attached to the bulkhead.
  - Connect the other end (15-pin DIN) to the back of the computer.  
**Note:** Connect this cable to the 15-pin connector on the video card in the first expansion slot. Do not connect to the 15-pin connector on the system board.
6. Complete installation of the 50-pin high density ribbon cable from the Camera Controller board to the Hobbes interface connector on the computer.
  - One end of this cable is already connected to the scanner's Camera Controller board at J1.
  - Connect the other end to the external connector for the scanner interface (Hobbes) card (P2) on the back of the computer.

## Installation of Host Computer and Peripherals

### Standalone Installation

7. Complete installation of one 9-pin D cable from the **Scanner Controller** main board to the **Com1** port on the back of the computer.
  - One end of this cable is already attached to the scanner's **Scanner Controller** main board at J9.
  - Connect the other end to the **Com1** port on the back of the computer.

Once all computer cabling connections have been made, set the computer on the shelf, coil any extra cabling under the computer shelf, and close the rear panels.

## Work Table

The standalone OpScan iNSIGHT 70 scanner comes with a work table. This work table is for the monitor, the keyboard, and the mouse. Instructions for assembling the work table are provided by the manufacturer.

## Monitor and Keyboard

Place the monitor, the keyboard, and the mouse on the work table. The monitor, the keyboard, and the mouse need to be cabled to the computer. (See Figure 3-5 for cable locations.)

### Monitor

1. Connect the power cord:
  - Plug the female end of the power cord into the port labeled **AC Outlet** on the back of the monitor.
  - Plug the other end (male end) into an AC wall outlet or power strip.
2. Ensure that the monitor cable is connected. (See Step 6 under cabling.)
3. Complete 5 BNC cable install from the bulkhead to the back of the monitor.
  - Connect one end of this cable to the bulkhead. Install the cable according to the colors labeled on the bulkhead.
  - Connect the other end (15-pin) to the back of the monitor.

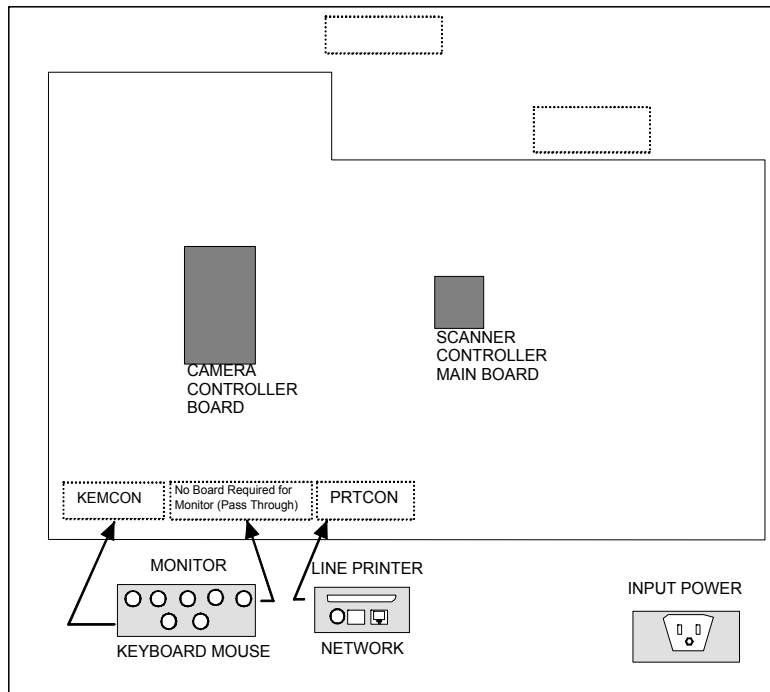
### Keyboard and Mouse

1. Plug the keyboard cable connector into the port labeled **KEYBOARD** located on the scanner's back panel (bottom and second cutout from the left).
2. Plug the mouse cable connector into the port labeled **MOUSE** located on the scanner's back panel (bottom and second cutout from the left).

### Board/Connector Relationship

Figure 3-2 illustrates the relationship between PC boards attached to the bulkhead inside the cabinet and the connectors on the exterior surface of the cabinet.

**Note:** There is a LINE PRINTER/NETWORK connector on the bottom left side of the cabinet. Only the LINE PRINTER connector is used in a standalone configuration.



**Figure 3-2 Standalone Board/Connector Locations**

## Network Installation

The OpScan iNSIGHT 70 scanner in a network configuration requires an Pearson NCS-supplied computer, monitor, keyboard, mouse and required networking equipment. An optional printer may also be installed.



*Figure 3-3 Network Connection*

## Computer

This section discusses installation and internal cabling for the host computer in a network configuration.

### Installation

Do the following.

1. Remove the computer's cover.  
**Caution:** Use ESD precautions (including a grounded wrist strap) for step 2.
2. Make sure the scanner interface cards and all ribbon cables are fully seated.
3. Replace the cover on the computer.
4. Open the rear panel doors and place the computer on the shelf. The front of the computer must face the front of the scanner.



## Cabling

In preparation for cabling, Pearson NCS recommends that you do the following:

- Set the computer on the back lip of the shelf during cable installation so that the back of the computer is tilted up. This provides easier access to the computer's ports.
- Uncoil all cords and cables, separate them, and lay them out on the floor.

The following cabling instructions are for a network configuration. Refer to Figure 3-3, Figure 3-4, Figure 3-5, and Table 3-1.

1. Install the computer power cord.
  - Attach the power cord connector to the back of the computer.
  - Ensure that the other end is plugged into the scanner's power strip.
2. Complete installation of the 25-pin straight through cable from the PRTCON board (for the optional printer) to the back of the computer.
  - One end of this cable is already attached to the PRTCON board.
  - Connect the other end to the back of the computer.
3. Complete installation of the network cable (10BaseT, 10Base2, or Token Ring) from the NETCON board (for the network) to the back of the computer.
  - One end of this cable is already attached to the NETCON board.
  - Connect the other end to the back of the computer.
4. Complete installation of one 6-pin DIN cable from the KEMCON board (for the keyboard) to the back of the computer.
  - One end of this cable is already attached to the KEMCON board.
  - Connect the other end to the back of the computer in the keyboard port.
5. Complete installation of the other 6-pin DIN cable from the KEMCON board (for the mouse) to the back of the computer.
  - One end of this cable is already attached to the KEMCON board.
  - Connect the other end to the back of the computer in the mouse port.
6. Complete installation of the 5 BNC/15-pin DIN cable from the bulkhead (for the monitor) to the back of the computer.
  - One end (5 BNC end) is already attached to the bulkhead.
  - Connect the other end (15-pin DIN) to the back of the computer.

**Caution:** Connect this cable to the 15-pin connector on the video card in the first expansion slot. Do not connect the cable to the 15-pin connector on the system board.
7. Complete installation of the 50-pin high density ribbon cable from the Camera Controller board to the Hobbes interface connector on the computer.
  - One end of this cable is already connected to the scanner's Camera Controller board at J1.
  - Connect the other end to the external connector for the scanner interface (Hobbes) card (P2) on the computer.

## Installation of Host Computer and Peripherals

### Network Installation

8. Complete installation of one 9-pin D cable from the Scanner Controller main board to the Com1 port on the back of the computer.
  - One end of this cable is already attached to the scanner's Scanner Controller main board at J9.
  - Connect the other end to the Com1 port on the back of the computer.

Once all computer cabling has been made, set the computer on the shelf, coil any extra cabling under the computer shelf, and close the rear panels.

## Monitor and Keyboard

Place the monitor on top of the scanner on the right-hand side (See Figure 3-3). Install the keyboard using the four pressure sensitive adhesive backed velcro pads that were shipped with the keyboard. Peel off the paper backing on one side of the pads and affix to the four corners of the keyboard. Peel off the paper backing from the other side and affix the keyboard to the angled shelf on the upper left-hand side of the scanner. Place the mouse and mouse pad on the flat surface just to the right of the keyboard (See Figure 3-3).

To cable the monitor and the keyboard to the computer, do the following:

### Cabling the Monitor

1. Attach the power cord.
  - Plug the female end of the power cord into the back of the monitor.
  - Plug the male end into a nearby AC power outlet or a power strip.
2. Ensure the monitor cable is properly connected. (Refer to Step 7, "Cabling.")
3. Complete 5 BNC cable install from the bulkhead to the back of the monitor.
  - Connect one end of this cable to the bulkhead. Install the cable according to the colors labeled on the bulkhead.
  - Connect the other end (15-pin) to the back of the monitor.

### Cabling the Keyboard and Mouse

1. Plug the keyboard cable into the port labeled KEYBOARD located behind the angled panel next to the keyboard.
2. Plug the mouse cable into the port labeled MOUSE located behind the angled panel next to the keyboard.

## **Networking Equipment**

OpScan *i*NSIGHT 70 scanners may be integrated into networking configurations consisting of third-party equipment.

The appropriate vendor personnel are responsible for unpacking, setting up, configuring, and testing the networking equipment. Pearson NCS field engineers are responsible for positioning the networking equipment in accordance to the system and network layout plans. These plans should be made available by the site preparation project manager.

Once the OpScan *i*NSIGHT 70 scanner has been installed and the networking equipment has been positioned, you can now connect the scanner to the network cable. Before connecting the cable to the system, verify the following:

- The scanner is positioned in the appropriate location.
- The network cable is installed.
- The OpScan *i*NSIGHT 70 scanner and peripherals are turned off.
- The cable is in good condition. It should not be crimped, have damaged insulation, and it should not be placed near heat sources, power cables, or high traffic areas without adequate protection.

### **Connecting a Scanner to a Network**

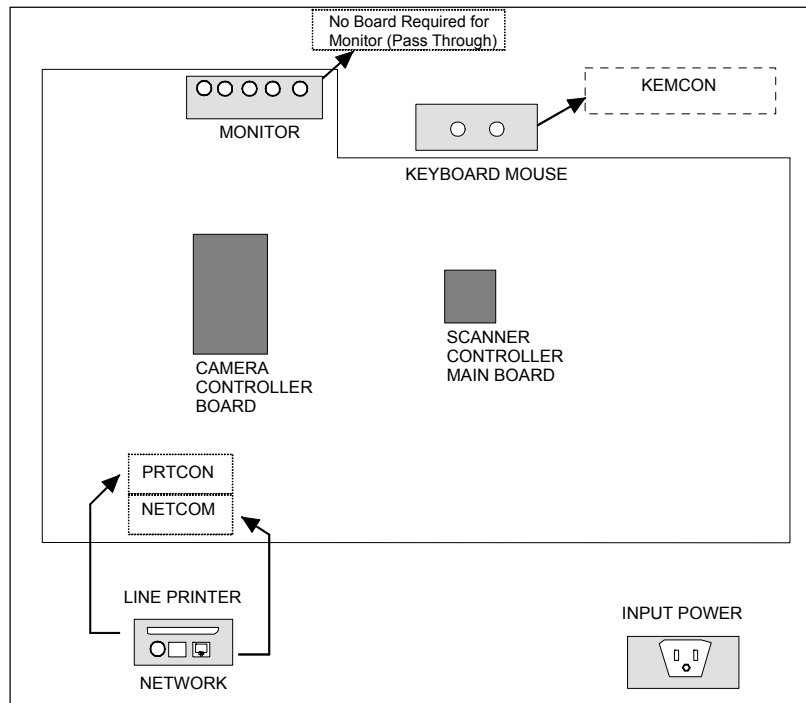
1. Locate the network cable for the scanner. A network connector (10BaseT, 10Base2, or Token Ring) should be attached to the network cable and located near each scanner (if more than one).
2. Attach the network connector (10BaseT, 10Base2, or Token Ring) to the jack labeled **NETWORK** located on the scanner's back panel (bottom and second cutout from the left).
3. Repeat steps 1 and 2 for each additional scanner.
4. Connect the other end of each network cable (from each scanner) to the network concentrator.
5. Locate and attach the cable from the concentrator to the connector jack located on the back of the file server.

## Installation of Host Computer and Peripherals

### Network Installation

#### Board/Connector Relationship

Figure 3-4 illustrates the relationship between PC boards attached to the bulkhead inside the cabinet and the connectors on the exterior surface of the cabinet in a network configuration.



**Figure 3-4** Network, Board/Connector Locations

## Internal Cable Connections

This section provides additional information regarding connection of the monitor, keyboard, mouse, cameras, power, network, and printer (optional) cables to the appropriate connectors on the boards located inside the scanner (Figure 3-4).

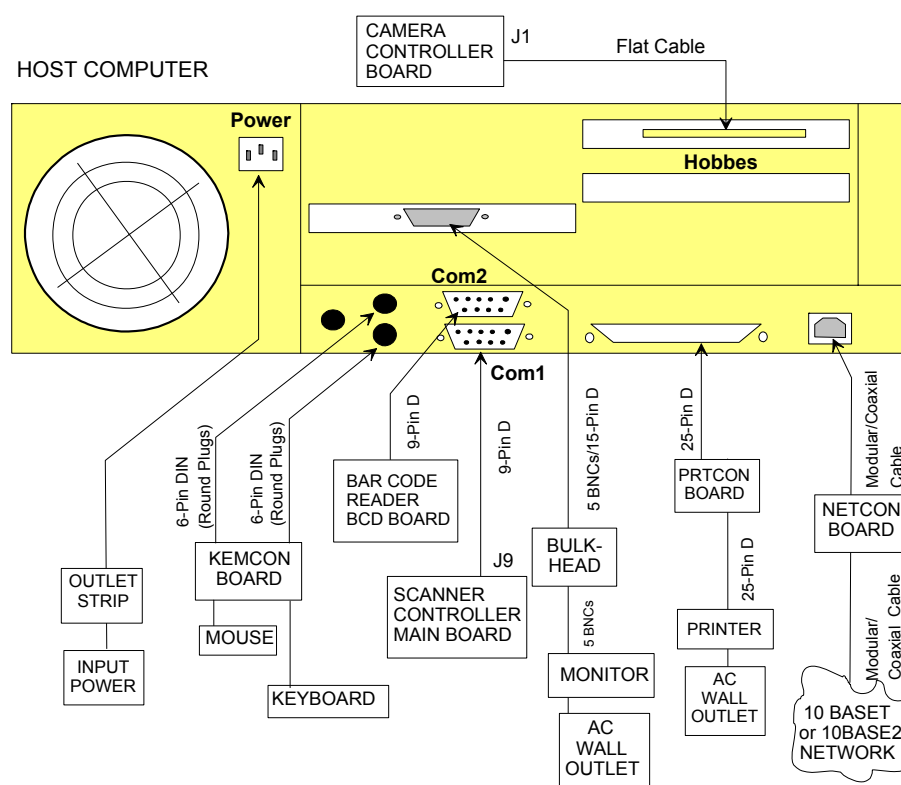
**Note:** The PRTCON, NETCON, and KEMCON<sub>1</sub> boards are attached to the interior of the scanner's bulkhead to provide an appropriate exterior connection to both standard and optional devices.

The PC boards include the following:

- Scanner Controller main board (bed control logic).
- Camera Controller board (camera, light source, and pixel normalization logic).
- NETCON board (Network).
- KEMCON board (Keyboard and mouse).
- PRTCON board (Printer, optional).

The schematic in Figure 3-5 identifies the cable connections to the appropriate boards and the appropriate connections of these cables to ports on the computer. The scanner is shipped with the cables already connected to the appropriate boards. Because the computer is shipped separately, you must install the computer and then make the necessary cable connections.

**Note:** The configuration may change depending on computer model.



**Figure 3-5 Computer and PC Board Connections**

## Installation of Host Computer and Peripherals

### Optional Equipment

Table 3-1 lists cables, part number, and host computer connectors.

**Table 3-1**

| Part Number | Description                   | Type                   | PC Connection    |
|-------------|-------------------------------|------------------------|------------------|
| 322 701 004 | Scanner controller            | 9-pin D                | Com1             |
| 342 915 006 | Hobbes, camera controller     | 50-pin flat cable      | Hobbes connector |
| 920 256 005 | Bulkhead to Monitor           | 5 BNCs                 | N/A              |
| 913 406 005 | Gender Changer                | HD 15 Female/Female    | N/A              |
| 920 256 013 | Bulkhead to PC                | 5 NBCs/15-pin D        | Video            |
| 920 401 015 | Keyboard/Mouse connectors (2) | 6-pin DIN (round plug) | Keyboard/Mouse   |
| 920 401 023 | Printer connector             | 25-pin D               | Parallel         |
| 913 027 017 | Phone - 14' wire male         | Modular cable          | 10BaseT          |
| 920 255 007 | BNC Coaxial, 8'               | Coaxial                | 10Base2          |
| 315 941 013 | Bar code to PC (optional)     | 9-pin D                | Com2             |

## Optional Equipment

Optional equipment includes system printers and the Bar Code Reader.

### System Printers

Cabling for system printers is slightly different for standalone and network configurations.

#### Standalone Printer

Unpack the printer and place it on the printer cabinet (a separate piece of furniture). Follow the instructions in the manufacturer's user manuals and install the printer as a parallel device. Use the 25-pin parallel interface cable to connect the printer to the port labeled **LINE PRINTER** located on the scanner's back panel (bottom and first cutout from the left).

For cabling instructions, do the following:

1. Attach the power cord.
  - Plug the female end into the back of the printer.
  - Plug the male end into the power strip (or wall outlet).
2. Attach the parallel interface cable.
  - Plug the male end of the parallel interface cable into the appropriate port on the back of the printer.
  - Plug the other end of the cable into the appropriate port labeled **LINE PRINTER** located on the lower left-hand side of the scanner's back panel.

### **Network Printer**

Unpack the printer and place it on the printer cabinet (a separate piece of furniture). Follow the instructions in the manufacturer's user manuals and install the printer as a parallel device, using the parallel interface cable to connect the printer to the network server or to a port located on the back of the scanner.

For cabling instructions, do the following (See Figure 3-5):

1. Attach the power cord.
  - Plug the female end into the back of the printer.
  - Plug the male end into the power strip.
2. Attach the parallel interface cable.
  - Plug the male end of the parallel interface cable into the port on the back of the printer.
  - Plug the other end of the cable into the appropriate port on the back of the network server or to a port labeled LINE PRINTER located at the bottom of the scanner's rear panel.

### **Bar Code Reader**

The optional Bar Code Reader is usually installed at Pearson NCS Manufacturing. It can also be installed in the field by a Pearson NCS technician. In both cases, the following cable connections must be performed as part of the initial installation.

There are two cables:

- 25-pin flat cable (I/O cable)
- 25-pin D-SUB to 9-pin D-SUB cable (Bar Code to PC cable)

The 25-pin flat cable has been pre-installed at Pearson NCS Manufacturing. You need to locate the 9-pin D-SUB end of the Bar Code to PC cable and plug it into the Com2 serial port on the back of the computer.

1. Ensure that the female end of the 25-pin flat cable is securely connected to the BCD board.
2. Ensure that the other end (also female) is securely connected to the 25-pin D-SUB end of the Bar Code to PC cable.
3. Plug the 9-pin D-SUB end of the Bar Code to PC cable into the Com2 port on the back of the computer.

## **Installation of Host Computer and Peripherals**

### Optional Equipment



# Chapter 4

## Scanner Checkout

### Overview

This chapter discusses the procedures for scanner checkout, pre-installed system software, system verification and backup, and customer hand-off.

### Scanner Checkout Procedures

To checkout the OpScan iNSIGHT 70 scanner, refer to the following sections in the *Maintenance Manual for the OpScan iNSIGHT™ 70 Scanner*:

- Hopper and Stacker Operational Checkout (Section 2.6)
- Sensor Checkout Procedures (Section 2.8)
- Read Station Adjustments (Section 3.2)
- Check Alignment (Section 5.2.4.8)
- Hopper Height Adjustments (Section 3.5)
- Pick Area Adjustments (Section 3.3)
- Calibrating (and Normalizing) the Scanner (Section E.2)

### System Software

OpScan iNSIGHT 70 scanner system software, ScanTools® Plus, is pre-installed at Pearson NCS. For information regarding this software, refer to the *ScanTools® Plus User's Guide*. This guide includes information on installation, setup, and configuration. Error messages are not documented in this publication. For information on the error messages, refer to the online help.

## System Verification

This section describes how to update the OpScan iNSIGHT 70 scanner system software.

### Requirements

You need to have an additional 90 to 100 MB of disk space if you intend to maintain a copy of the old and new software.

You need to have 128 MB of paging space for the file server and 32 MB of paging space for each edit workstation.

Before updating the OpScan iNSIGHT 70 scanner software, make sure that the following are installed and configured:

- Windows XP operating system
- Scanner software

For more information on special requirements for your site, see the Release Notes accompanying the update media.

### OpScan iNSIGHT 70 Scanner System Software

The OpScan iNSIGHT 70 scanner system software arrives completely configured.

## Customer Hand-off

Once everything is working properly, go through the customer training checklist to ensure the customer understands scanner operation and maintenance.

1. Identify the main scanner parts and explain the purpose.
  - Power Switch - Turns on the system's power
  - READY switch - Starts and stops the scanner
  - Input hopper - Holds up to 750 sheets
  - Input hopper height adjustment switch - Adjusts the input hopper up/down
  - Transport bed - Senses if the form is aligned and passes it between the read heads
  - Bar code reader - Reads bar codes on forms
  - Turnaround station - Sends the forms to the output hopper or the select stacker
  - Transport printer - Prints information on the forms
  - Select Stacker - Holds forms with errors (up to 200 sheets)
  - Output Hopper - Holds forms without errors (up to 750 sheets)
  - Output Hopper Height Adjustment Switch - Adjusts the input hopper up or down

2. Demonstrate how to operate the scanner.
  - Turn on the system.
  - Load the input hopper.
  - Run ScanTools Plus and select the appropriate application.
  - Monitor the scanning process for operational messages.
  - Stop the scanner/restart.
  - Unload the select stacker/output hopper.
  - Turn off the system.
3. Demonstrate the operation of other system components.
  - Computer
  - Printer
4. Correct errors using ScanTools Plus with sample application.
  - Feed a form with timing mark in the wrong position.
  - Create a mechanical error and correct it.
  - Create a paper jam and correct it.
  - Repair a damaged form.
5. Demonstrate periodic maintenance.
  - Clean the upper transport bed.
  - Clean the lower transport bed.
  - Clean the outer turnaround.
  - Clean the glass on the light source assembly.
  - Clean/replace the scanner cooling fan filter.
  - Remove/replace the pick belt.
  - Remove/replace the sheet retard pad.
6. Demonstrate transport printer maintenance.
  - Change the printer ribbon cartridge.
  - Explain the one-time ribbon intensity adjustment.
7. Demonstrate bar code reader operation.
  - Reader position adjustment
  - Bar code reader problem solving
8. Demonstrate how to run the Quick Check Utility (See *Quick Check Guide for the OpScan iNSIGHT™ 70 Scanner*).
9. Demonstrate how to run the Scanner Exerciser Utility (See Appendix C in the *Operator's Guide for the OpScan iNSIGHT™ 70 Scanner*).
10. Identify system user manuals.

## **Scanner Checkout**

### Customer Hand-off

- 11.** Discuss operator safety.
  - Turn off the scanner while working on it.
  - Only one person should maintain the scanner.
  - Do not wear loose clothing or jewelry while working on the scanner.
- 12.** Identify who to call for assistance.

Pearson NCS Customer Support: 1-800-338-5544

This completes the customer hand-off procedure.

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